

Remarks/Arguments:

Claims 9-17 are pending and stand rejected.

By this Amendment, claim 9 is amended. This amendment incorporates dependent claim 11 into the body of claim 9, and is supported by the specification as originally filed. As such, claim 11 is canceled. No new matter has been added.

The amendment to claim 9 further clarifies that the direction of the flow of fluid in a single flow channel is entirely transverse to the UV emitters. Support for this amendment is found in the specification as originally filed, for example, on page 1 at [0010], page 2 at [0019], and in FIG. 1. It is noted that the direction of the flow of fluid in a single flow channel being entirely transverse to the UV emitters is an important aspect of the present invention. As stated in the specification as originally filed, this "arrangement ensures effective swirling of the flowing fluid, wherein greater flow resistance builds than in the case of emitters arranged longitudinally to the flow. (Specification, page 1 at [0010]).

No new matter has been added.

Rejections of Claims 9-13 and 15-17 under 35 U.S.C. §103(a)

In the Office Action, claims 9-13 and 15-17 were rejected under 35 U.S.C. §103(a) as unpatentable over Hillman (U.S. Patent No. 4,336,223, hereafter referred to as Hillman) in view of Prieve et al. (U.S. Patent No. 6,269,680, hereafter referred to as Prieve).

Reconsideration is respectfully requested.

Claim 9

Claim 9 is directed to a device for the UV treatment of fluids flowing in a single flow channel, comprising: a plurality of cylindrical low-pressure mercury UV emitters that are arranged in groups in said single flow channel, wherein longitudinal axes of said UV emitters are disposed substantially parallel to one another and transverse to the flow of fluid in said single flow channel such that the UV emitters of a given group are disposed in a plane and the direction of the flow of fluid in said single flow channel is entirely transverse to the UV emitters; at least one elongated sensor arrangement also arranged in said single flow channel and adapted to monitor an operating state of said UV emitters, wherein said at least one elongated sensor arrangement is spaced from and parallel to one of said groups of said UV emitters, wherein said at least one elongated sensor arrangement extends substantially transverse to said longitudinal axes of said UV emitters of the adjacent group, and wherein said at least one

elongated sensor arrangement is provided with a separate UV sensor for each UV emitter of that group; and at least one unit connected with said at least one elongated sensor arrangement and adapted to control and/or regulate said UV emitters.

Moreover, a sensor arrangement is parallel to one of the groups of UV emitters but transverse to the longitudinal axis of an individual UV emitter of the group. Each sensor arrangement has a separate UV sensor for each UV emitter of the group.

Hillman Reference

Hillman discloses an arrangement of UV emitters that are disposed in individual tubes 14-17 that branch off from a main water inlet conduit 12. Tubes 14 and 15 split the flow of water away from header 13 towards header 18, and tubes 16 and 17 split the flow of water returning from header 18 to header 13. The water is discharged through the outlet conduit 19. See Hillman at Column 4, Lines 12-17. Figure 4 also shows that the fluid flow entering at bore 25 and exiting at bore 25' is diverted by, and around, a central barrier 25a. Hillman at Column 4, Lines 34-39, and Figure 4. Contrary to the Final Rejection, Hillman does not disclose a single flow channel. Hillman describes four distinct paths or flow channels.

The Examiner states that Hillman teaches the use of a plurality of UV emitters arranged in groups in a single flow channel. Specifically, the Examiner states, "It can be seen that the fluids are being flowed from the inlet (generally found near reference number 25) along the UV emitter tubes (44 and 45) in the same direction, then redirect the flow along UV emitter tubes (46 and 47) to the outlet (generally found near reference number 25' and 27). ... This system is to be viewed as a single flow as there is effectively only one path through which the fluids can flow from the inlet to the outlet." Office Action dated July 6, 2009, page 2. The Examiner characterizes this as a single flow, in a net result direction from inlet 25 to outlet 25'. Office Action dated July 6, 2009, page 4. Having characterized this as single flow, the Examiner argues that UV emitters are arranged in groups based on the flow direction of the fluids. Applicants respectfully request reconsideration.

The system in Hillman shows multiple paths through which the fluids can flow. Fluid may flow through either tube 14 or 15, and through either tube 16 or 17. Thus, the fluid may travel through four distinct paths through multiple flow channels. The flow of fluid, as taught by Hillman, is necessarily split and diverted through the use of headers, tubes, and a barrier.

Additionally, the UV emitters of the present invention are arranged in groups such that the emitters are transverse to the flow of fluid in a single flow channel at the instance that the fluid flows past the UV emitters, not simply transverse to the net result direction of the fluid flow. This distinction is an important aspect of the present invention, as this arrangement

enables effective swirling of the flowing fluid for more effective UV treatment. Additionally, the arrangement of the present invention enables greater flow resistance to build than in the case of emitters arranged longitudinally to the flow. The Office Action of July 6, 2009 notes that Hillman features fluid "being flowed from the inlet (generally found near reference number 25) along the UV emitter tubes (44 and 45) in the same direction, then redirect to flow along UV emitter tubes (46 and 47) to the outlet (generally found near reference number 25' or 27)." Office Action of July 6, 2009, Page 2, Lines 6-9. That is, Hillman does not teach "a device for the UV treatment of fluids flowing in a single flow channel comprising a plurality of cylindrical low-pressure mercury UV emitters, arranged parallel to one another in groups, which are transverse to the flow of fluid in the single flow channel such that the UV emitters of a given group are disposed in a plane and the direction of the flow of fluid in said single flow channel is entirely transverse to the UV emitters," as required by claim 9. This is because, for example, Hillman does not contemplate the use of a single flow channel where the direction of the flow of fluid in said single flow channel is entirely transverse to the UV emitters.

Prieve Reference

The addition of Prieve does not overcome the deficiencies of Hillman. This is because, Prieve does not disclose or suggest "a device for the UV treatment of fluids flowing in a single flow channel comprising a plurality of cylindrical low-pressure mercury UV emitters, arranged parallel to one another in groups, which are transverse to the flow of fluid in the single flow channel such that the UV emitters of a given group are disposed in a plane and the direction of the flow of fluid in said single flow channel is entirely transverse to the UV emitters," as required by claim 9. That is, Prieve is silent regarding the UV treatment of fluids flowing in a single flow channel where the direction of the flow of fluid in said single flow channel is entirely transverse to the UV emitters.

Accordingly, claim 9 is submitted to patentably distinguish over Hillman in view of Prieve for at least the above-mentioned reasons.

Claims 10

Claim 10, which includes all of the limitations of claim 9, is submitted to patentably distinguish over Hillman in view of Prieve for at least the same reasons as the independent claim from which it depends.

Claims 11

Claim 11 is canceled by this amendment.

Claims 12

Claim 12, which includes all of the limitations of claim 9, is submitted to patentably distinguish over Hillman in view of Prieve for at least the same reasons as the independent claim from which it depends and on its own merits. Claim 12 is directed to a device according to claim 9, wherein said at least one elongated sensor arrangement is disposed transverse to a direction of flow of said fluids in said flow channel. Reading the limitation of claim 12 with the limitations of claim 9, from which it depends shows that the elongated sensor arrangements of the present invention are disposed transverse to a direction of fluid flow in a single flow channel, such that the elongated sensor arrangement is spaced from and parallel to one of the groups of UV emitters. In this manner, the elongated sensor arrangement extends substantially transverse to the longitudinal axes of the UV emitters of the adjacent group.

The Office Action states in referring to Fig. 4 of Hillman that, "although the net result of the path of the fluid along the elongated sensor arrangement (13) is parallel from inlet (25) to outlet (25'), a majority of the direction of flow is transverse to the elongated sensor arrangement (13) so that the fluids may flow parallel to the tubes. Office Action dated July 6, 2009, page 5. Reconsideration is respectfully requested.

The system of the present invention features a sensor arrangement which is simultaneously parallel to a group of emitters, transverse to the longitudinal axes of the UV emitters of that group, and transverse to the direction of flow of fluid. This is shown in Fig. 1 of Applicants' present invention. Claim 9, from which claim 12 depends, as amended further requires that this occurs such that the UV emitters are transverse to the flow of fluid. As Examiner states, some direction of flow is transverse to the elongated sensor arrangement in Hillman, but this occurs where the fluids may flow parallel to the tubes and, thus, parallel to the UV emitters. Hillman does not teach "an elongated sensor arrangement, disposed transverse to a direction of flow of fluids in a flow channel," as required by claim 12. The addition of Prieve does not overcome the deficiencies of Hillman. Accordingly, claim 12 is submitted to patentably distinguish over Hillman in view of Prieve for at least the above-mentioned reasons.

Claims 13, 15, 16, and 17

Claims 13, 15, 16, and 17, which include all of the limitations of claim 9, are submitted to patentably distinguish over Hillman in view of Prieve for at least the same reasons as the independent claim from which they depend.

Rejections of Claim 14 under 35 U.S.C. §103(a)

In the Office Action, claim 14 is rejected under 35 U.S.C. §103(a) as unpatentable over Hillman in view of Prieve as discussed above, and in further view of Ifill et al. (U.S. Patent No. 5,019,256, hereafter referred to as Ifill).

Reconsideration is respectfully requested.

Claim 14

Claim 14 is directed to a device for the UV treatment of fluids flowing in a single flow channel, wherein at least one elongated sensor arrangement is disposed between two groups of UV emitters, wherein a support plate carries said UV sensors on two oppositely facing flat sides thereof, and wherein UV sensors of a given flat side of the support plate face a respective one of the groups of UV emitters.

Ifill discloses a modular UV lamp rack assembly having an array of lamp units in which each unit may readily be withdrawn and replaced without disturbing the other units. Ifill does not teach or suggest the use of an elongated sensor arrangement disposed between two groups of UV emitters, wherein a support plate carries said UV sensors on two oppositely facing flat sides thereof, and wherein UV sensors of a given flat side of the support plate face a respective one of the groups of UV emitters for the purpose of decreasing the number of essential parts, thereby reducing cost. This is because, for example, Ifill does not contemplate the use of elongated sensor arrangements.

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Conclusion

In view of the claim amendments, and remarks, Applicants submit the application is in condition for allowance, which action is respectfully requested. The Examiner is invited to telephone Applicants' attorney if it is believed that a telephonic interview would expedite prosecution of the application.

Respectfully submitted,



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